



Land Warrior/Future Warrior

DARPA Soldier Enhancement Workshop

23 Sep 99

Bill Brower

APM Future Soldier

Office of PM-Soldier

Telephone: (703) 704-2888

wbrower@pmsoldier.belvoir.army.mil



Project Manager-Soldier

The Soldier System

The Fundamental Interface Between the:

- Trained and Ready Soldier
- Extremes of Operational Mission Environment
- Enhanced Lethality to the Digital Battlefield



Sampling of PM-Soldier Programs:

- Land Warrior
- Modular Sleeping Bag
- Body Armor/Load Carriage
- Dress Uniforms & PT Uniform

PROJECT MANAGER
SOLDIER



What is Land Warrior?

Integration of Infantry Soldier Combat Capabilities into a Warfighting System Optimized for Close Combat

LW Consists of:

- **Weapon System**
- **Integrated Helmet Assembly**
- **Computer/Radio**
- **Software**
- **PCIE**



Merges Existing and Developing Capabilities to Enhance the Rifle Squad Soldier's Performance on the 21st Century Battlefield



What is Land Warrior?

Integration of Infantry Soldier Combat Capabilities into a Warfighting System Optimized for Close Combat

LW Consists of:

- **Weapon System**
- **Integrated Helmet Assembly**
- **Computer/Radio**
- **Software**
- **PCIE**



Merges Existing and Developing Capabilities to Enhance the Rifle Squad Soldier's Performance on the 21st Century Battlefield

Land Warrior Components

Computer/Radio

Computer (COTS/GOTS)
Soldier Radio (COTS/GOTS)
Squad Radio (ASIP Rpg)
GPS
Handheld Flat Panel Display

Software

Software (COTS/GOTS)
(Minimum Custom)

Protective Clothing and Individual Equipment

Modular Lightweight Load Carriage
Equipment MOLLE (Marine/Army Program)
Interceptor Body Armor (Marine/Army Program)
Other Clothing and Individual Equipment

Integrated Helmet Assembly

Helmet With Improved
Suspension
Helmet Mounted Display
Image Intensifier With Integrated
Display
Laser Detectors
Wiring Harness

Weapon

Modular Weapon System
Laser Rangefinder/Digital Compass
Wiring Harness
Video Gun Sight
Thermal Weapon Sight
IR Laser Pointer



Foundation For Technical Architecture

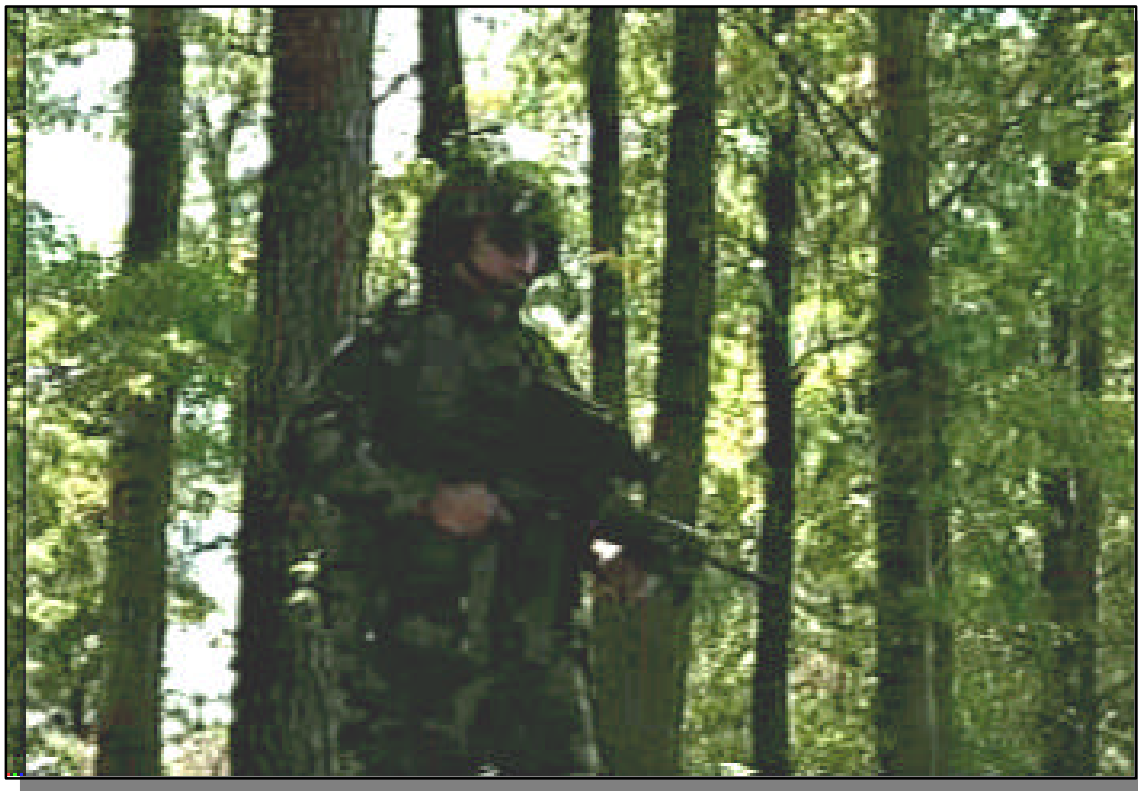


Land Warrior

Integration of Infantry Soldier Combat Capabilities into a Warfighting System Optimized for Close Combat

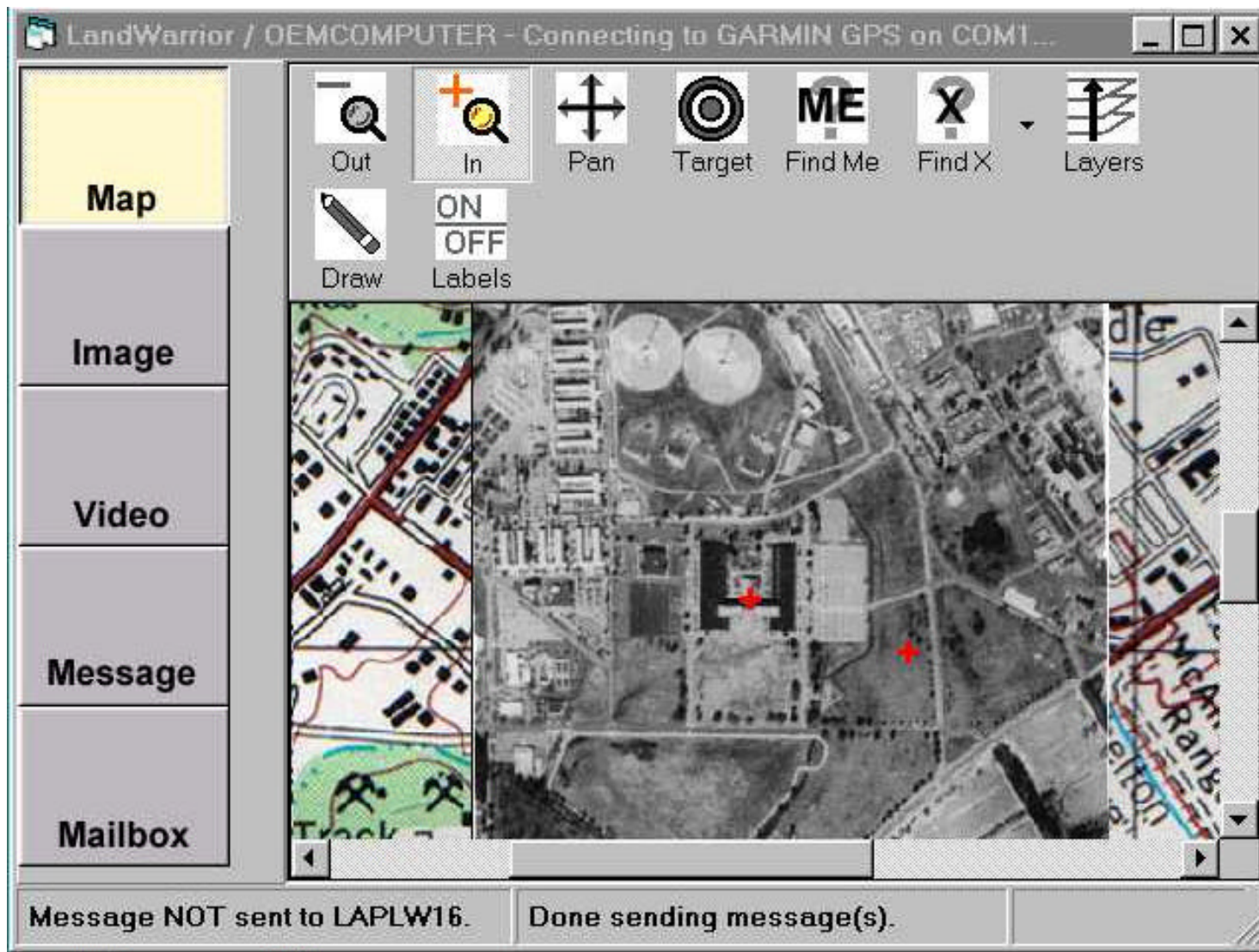
Capabilities:

- **Command & Control**
- **Survivability**
- **Situational Awareness**
- **Lethality**
- **Mobility**
- **Training**



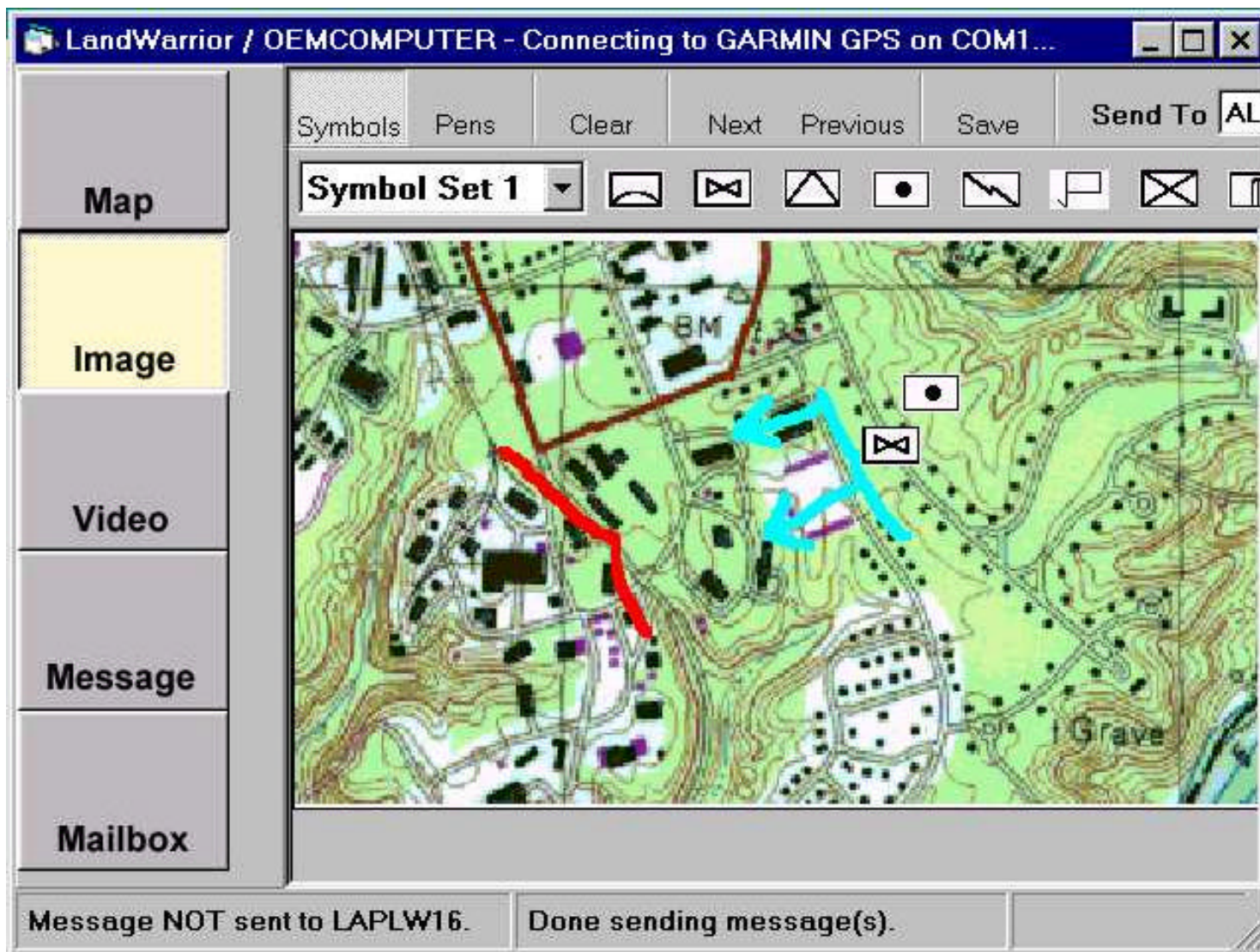


Land Warrior Capability Navigation





Land Warrior Capability Images





Land Warrior Capability Reports

LandWarrior / OEMCOMPUTER - Connecting to GARMIN GPS on COM1...

Fire Support Combat Ops Combat Svcs Info / Intel low Pri low C

IDENTIFIER: Spot Report SEND TO: ALL

SIZE	UNIFORM
1	Squad
ACTIVITY	TIME
Attacking	use CURRENT ZULU TIME
LOCATION	EQUIPMENT
use SOLDIER Coords	Rifles
FREE TEXT	
<div></div>	

Message NOT sent to LAPLW16. Done sending message(s).



Land Warrior Capability Messages

LandWarrior / OEMCOMPUTER - Connecting to GARMIN GPS on COM1...

Received **Outgoing** Ack Manager

PRI	CL	DATE/TIME	MSG TYPE	SENT TO
H	L	9/21/99 10:48:41 PM	Call for Fire	ALL
H	L	9/9/99 4:34:46 PM	Call for Fire	ALL

Map
Image
Video
Message
Mailbox

MISSION TYPE=Immediate Suppression
TARGET TYPE=Troops in Treeline
SIZE=3
AMMO=Smoke
TIME=+10 minutes
TEXT= This is just a test message
--END

Message NOT sent to LAPLW16. Done sending message(s).



The Reasons for LW Objective Development

- 1) Consolidate Functionality to Reduce Weight and/or Cost
(i.e. Integrated Environmental, NBC, and Signature Reduction in Uniform, Multifunction Laser, etc.)**
- 2) Integration of Components from Systems performing Similar Functions to Reduce Weight and/or Cost
(i.e. Integration with JAVELIN, Combat ID, MILES, etc)**
- 3) Enhancements of Objective Capabilities
(i.e. Color Display, Embedded Training, Increased GPS Accuracy, etc.)**

Critical to Achieve Objective Soldier as a System



Objective Requirements Transition

- **Continuing EMD and Transitions into Production are Required to Achieve the Objective Land Warrior System as Described by the Operational Requirements Document (ORD)**
- **Power Key Performance Parameters (KPP) are time Phased**
 - Initial Production plus 2.5 years
 - Initial Production plus 5 years
- **LW ORD Contains More than 75 Objective Requirements**
- **Objective Requirements will be Time Phased into Production Based on Funding and Technology Maturity**



Objective Requirements Examples

Mobility: Decrease the rifle squad soldier's load while providing equal or better capabilities

Survivability: Ballistic protection of the entire body (to include the head) will be optimized to provide the best battle outcome for those units engaged in the close fight.

Improved laser and ballistic eye protection.

A lighter (≤ 2 ounces), smaller JCAD configured/integrated with LW displays, controls, communications, and electronics to accelerate more effective warnings.

Protective garments that provide integrated environmental, NBC, signature reduction, and ballistic protection with temperature monitor/control.

The CRS will interface with a LW compatible Physiological Status Monitoring (PSM) capability.

Lethality: See-through sensor fusion (thermal, image intensification, color imaging) capability to increase soldier/unit performance, reduce weight by reducing number of components carried, and allow for greater situational and environmental awareness.

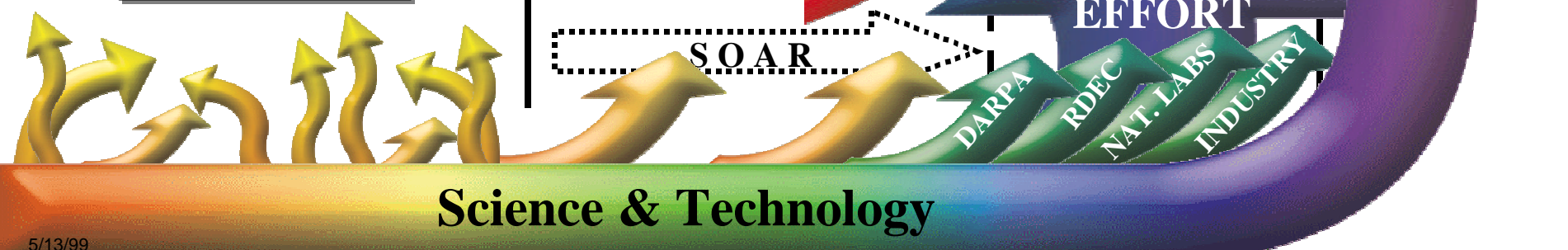
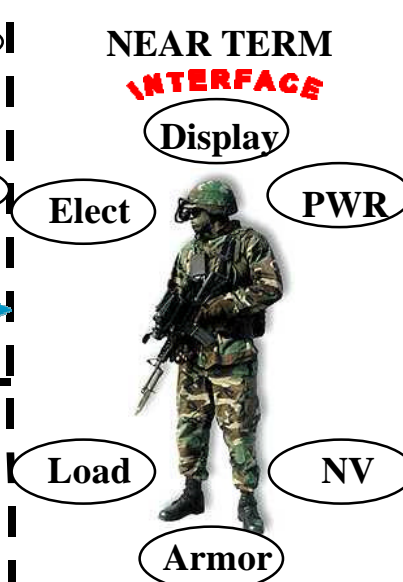
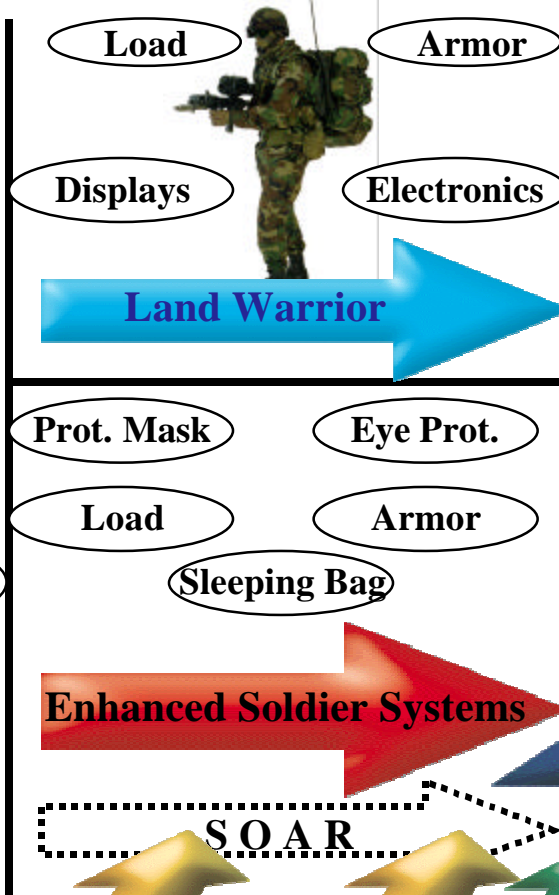
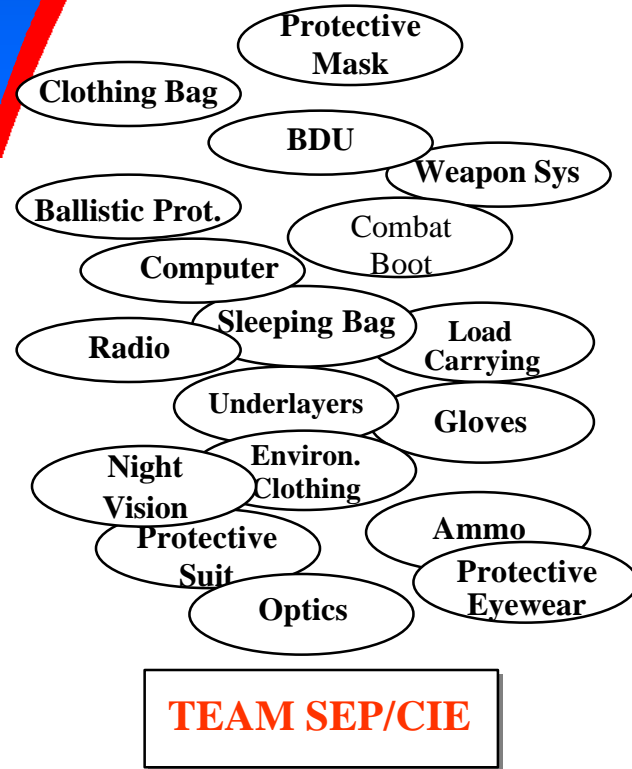


The Path Forward

Where We Were

Where We Are

Where We Should Be





Where are We Headed? Glimpse of the 2010 Soldier

**Body Suite w/Physiological
Sensors**

Benefits: Increased Survivability

**Increased Data Rate
and Range**

Benefits: Increased C2

Platform Connectivity

Benefits: Increased SA

**Hybrid Fuel Cell/
Rechargeable Battery**

**Benefits: Reduced Weight
& Cost & Increase Mission
Duration**



**Fused Thermal/I2, Increased
FOV & Color Display**
Benefits: Target Acquisition

Multifunction Laser
**Benefits: Reduced Weight & Cost
(Eliminates Individual PEQ-2C,
PAC-4, MILES, CID Laser, Borelight,
Range Finding Lasers)**

**Objective Individual
Combat Weapon**

Benefit: Increased Lethality

**Integrated Environmental,
NBC, Signature, & Ballistic
Protection Uniform**

**Benefits: Reduced Weight
(Eliminates Over-Garments)**

Enabling Technologies Required

MEMS - Sensors, Electronics, etc

Materials - Ballistic, Conducting Fabrics, etc

Comms - Advanced Waveforms & Antennas

Power - Miniature fuel reformer, low power electronics, etc



Individual Soldier Augmentation Areas Needing Research

Strength/Endurance

Acoustic Detection



Micro Climate Conditioning

Olfactory Detection



Summary



**... you may fly over a land forever;
you may bomb it,
atomize it,
pulverize it and
wipe it clean of life -
but if you desire to defend it,
protect it and
keep it for civilization,
you must do this on the ground,
the way the Roman legions did,
by putting your young men into the
mud.**

T.R. Fehrenbach
This Kind of War